

protein content have been observed; and it has been found that in some instances a variety such as Tuscan, which is usually considered as being low in protein, is capable of approximating even Pearl in this respect. It is premature yet to base any conclusions on the work already completed, but the preliminary investigations indicate that systematic work on these lines will be productive of real economic advantage to the wheat industry.

In the baking section the action of different additives, such as milk, and the effects of different yeasts and of different methods of manufacture are being investigated, so as to guide bakers in securing the best bread from the flour produced in the Dominion.

Leading members of the milling and baking trades are taking a considerable interest in the work and are frequent visitors at the laboratory.

Affiliation has been arranged with the British Flour-millers Research Association, and by means of this co-ordination the Institute will receive invaluable assistance from those who for some years past have been engaged upon cereal investigations.

#### PLANT-BREEDING AND SEED RESEARCH.

##### PLANT RESEARCH STATION.

Advisory Committee: Mr. W. D. Hunt (Chairman) and Mr. C. H. Hewlett, representing the seed trade; the Hon. G. Fowlds and Professor G. S. Peren, representing the Massey Agricultural College; Dr. C. J. Reakes, representing the Department of Agriculture; Mr. Q. Donald and Mr. T. Rigg, representing the Council of Scientific and Industrial Research; Mr. W. Perry, representing the Board of Agriculture; Dr. F. W. Hilgendorf, representing the Wheat Research Institute. Director of Plant Research Station: Mr. A. H. Cockayne.

The sections of the Plant Research Station comprise the following: Administrative, Mycological, Seed-testing, Field Crop, Field Experimentation, Entomological, Grassland Investigations and Plant-breeding.

The Plant Research Station established during the year at Palmerston North consists of the specialist officers of the Fields Division of the Department of Agriculture, using the grant of the Empire Marketing Board, £2,000 per annum for five years, subsidized by the Department of Scientific and Industrial Research, to provide additional pure-research officers to complete a plant-research staff.

In the Director's report, which follows, work is described much of which belongs more properly to the Department of Agriculture, but which, by courtesy of the Director-General, is included here, since the more fundamental work of the Plant Research Station has been closely interwoven with the field-work of the officers of the Department of Agriculture.

##### DIRECTOR'S REPORT.

After negotiation between the Scientific and Industrial Research Department and the Department of Agriculture, the Plant Research Station at Palmerston North was established. In it have been incorporated the whole of the specialist and research officers of the Fields Division, and this staff has been strengthened by fresh appointments made by the Scientific and Industrial Research Department. The station is under the directorship of Mr. A. H. Cockayne, and administration funds are provided partly by the Department of Agriculture and partly by the Scientific and Industrial Research Department, in conjunction with moneys from the Empire Marketing Board. The special interests of the Scientific and Industrial Research Department are safeguarded by a special committee that has been set up by that Department; but, in addition to this, the whole of the work of the station, in so far as it affects both Departments, comes under review by that committee. The station in its present form has been in existence for only twelve months, and, as was to be expected, considerable preliminary work has to be carried out before it can be put in full working-order.

##### *Buildings and Land.*

An area of 14 acres adjacent to Massey Agricultural College has been secured for the location of laboratory and other buildings, and to provide experimental land for the research work undertaken. In addition, the experimental areas of the Department of Agriculture in various parts of New Zealand are at the disposal of the research staff for more comprehensive field-work, and the agricultural instruction staff of the Department of Agriculture work in co-operation with the specialist officers of the station in the general field and grass-crop experimental work of the Department.

Permanent laboratories and administrative offices have not yet been erected on the experimental grounds at Palmerston North, but efficient temporary laboratory accommodation for the various units of the station has been provided in the town itself. On the return of Dr. G. H. Cunningham from America and Europe comprehensive plans for permanent buildings will be brought forward. In the meantime, however, it can be said that the temporary provision already made has enabled the specialist staff to carry on under quite satisfactory conditions.

On the experimental area itself the only permanent buildings that have been erected are a range of greenhouses specially devoted to mycological investigations, and these are being added to at the present time to enable entomological work in connection with virus diseases of plants to be undertaken. During the year a chemist has been under special training at Cawthron Institute. Laboratory accommodation has now been provided for him at Palmerston North, so that the chemical end of the plant research work being undertaken can now be properly co-ordinated.

##### *Mycological Investigations.*

With land available and greenhouse accommodation, the following work has been undertaken during the period:—

*Cereal Diseases.*—Further bulk treatments have led to practically the whole of the malting-barley of Canterbury being rendered smut-free; and promising results have likewise been secured with smut-control of oats and wheat.